

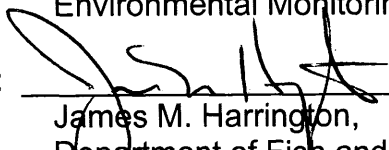
STANDARD OPERATING PROCEDURE
Instructions for the Calibration and Use of a Spherical Densiometer

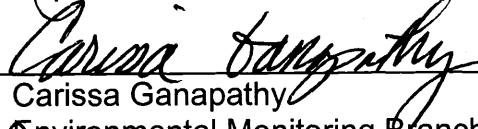
KEY WORDS

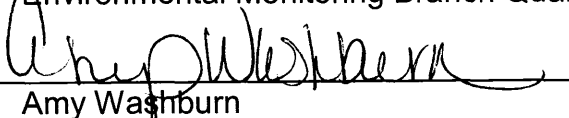
Physical habitat assessment, Canopy density, Overstory density

APPROVALS

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Environmental Monitoring Branch organization and personnel, such as management, senior scientist, quality assurance officer, project leader, etc., are defined and discussed in SOP ADMN002.

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1.0 INTRODUCTION

The physical habitat conditions of a stream are assessed when determining the integrity of a wadeable stream. Estimation of canopy cover contributes to the assessment. A densiometer is used to measure the amount of surface water that is covered by shade from streamside vegetation.

1.1 Purpose

This Standard Operating Procedure (SOP) describes the method to quantify canopy density using a spherical densiometer.

1.2 Definitions

1.2.1 Canopy density- the thickness and consistency of plant foliage

1.2.2 Overstory- the overhead foliage

1.2.3 Transects- a mark or line cut across the width of the stream, representing the measuring point

1.2.4 Sampling point – a selected riffle or transect from which to collect the sample and also collect physical habitat data

2.0 MATERIALS

2.1 Spherical densiometer



3.0 PROCEDURES

The methodology described in this document was modified from the Forest Densiometer Instruction Sheet.

3.1 Choosing Sites

3.1.1 Follow procedures described in SOP FSWA013.00 or the project protocol to determine the sampling points at which to take densiometer measurements (site determination and transect location).

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- 3.1.2 Take four densiometer readings from the center of each of the 11 transects while facing north, south, east and west. Average these four readings.
- 3.1.3 Facing up stream, keep the instrument leveled (indicated by the round level in the lower right-hand corner). Hold the densiometer far enough away from your body so that your head is just outside the grid (12-18" away). Maintain the densiometer approximately 1 foot above the water.
- 3.13 There are a total of 24, 1/8" x 1/8" squares in the grid. Each square represents an area of canopy opening (sky image or unfilled squares) or canopy cover (vegetation image or filled squares). Count the number of canopy opening squares. If there are squares that are only partially filled, these can be added to make a complete square.
- 3.1.4 The uncovered area is determined by multiplying the number of squares by 4.17. Subtract this number from 100% to determine overstory density in %.

e.g. $100\% - (10 \text{ unfilled squares} \times 4.17) = 58.3\% \text{ overstory density}$
- 3.1.5 If more than half of the canopy area is open sky the counting process can be reversed. Count the filled square areas that are covered by the canopy. Multiply by 4.17 to obtain the estimated overstory density directly in percent.

i.e. $\text{Number of filled squares} \times 4.17 = \% \text{ overstory density}$

4.0 SPHERICAL DENSIMETER STORAGE

The spherical densiometer is designed for rugged field use. To store, close the lid and securely fasten the clasp.

5.0 CLEANING THE DENSIMETER

Clean the face of the densiometer by dusting with a soft cloth.

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6.0 REFERENCES

Forest Densiometer Instruction Sheet
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